

Japanese (PDF)

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TECHNICAL FIELD PRIOR ART EFFECT OF THE
INVENTION TECHNICAL PROBLEM MEANS
OPERATION EXAMPLE DESCRIPTION OF
DRAWINGS DRAWINGS

[Translation done.]

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Notes:

1. Untranslatable words are replaced with asterisks (***)
2. Texts in the figures are not translated and shown as it is.

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Dictionary: Last updated 04/14/2009 / Priority: 1. Electronic engineering / 2. Manufacturing/Quality / 3. Technical term

FULL CONTENTS

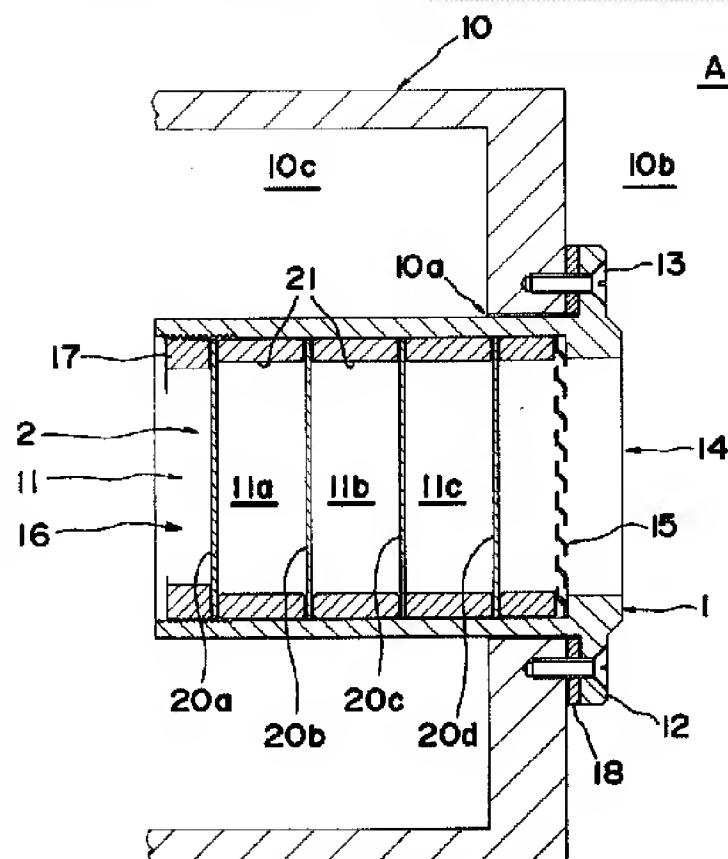
[Claim(s)]

[Claim 1] A dehumidifier system provided with an aeration object which provides a gap in an inside of said tube-like object, arranges a tube-like object which forms an aeration way which is attached to a wall of a container and opens inner and the exterior of this container for free passage, and two or more waterproof membranes which have a penetration micropore in which; moisture permeation is possible, and covers said aeration way to two or more steps, and;

[Claim 2] A dehumidifier system having an oscillating means which gives aerial vibration pressure to said waterproof membrane in the dehumidifier system according to claim 1.

[Claim 3] A dehumidifier system, wherein said aeration way is provided with an electronic cooling element which a cooling unit was turned to the container side bordering on a waterproof membrane, and turned an exothermic part to the

Drawing selection Representative draw



[Translation done.]

open air side in the dehumidifier system according to claim 1 or 2.

[Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to a dehumidifier system suitable for dehumidification of the container of prevention of moisture and a dripproof structure, especially the apparatus of outside installation.

[0002]

[Description of the Prior Art] The waterproofing seal was provided in the opens part, and the incoming line part was protected by waterproofing grand packing etc. at the container, for example, the electric elegance storage box of outside installation, aiming at conventional prevention of moisture and drip-proofing. In the above-mentioned structure, since the open air may have been called in by the respiration by the difference in temperature of the inside and outside of a box and it may have dewed in a box, the aeration way was established in the box, and there was a thing it was made to make equip with the moisture absorption material which provided the filter facility in this aeration way.

[0003]

[Problem to be solved by the invention] However, once the steam concentration of an inside becomes high, [the conventional prevention of moisture and dripproof structure] Although the structure reverse-acted and the steam concentration of the open air became low, when the ionic impurity which dews apparatus finally failing in a dry state, and is contained in it was condensed, there was a problem that apparatus might be made to malfunction or a breakdown might be carried out.

[0004] In the thing which makes an aeration way equip with moisture absorption material, since it absorbed moisture regardless of the respiration of a box, when using it for a long period of time, having continued, not much regardless of the size of a box, the big thing of capability was needed, and there was a problem of not being efficient.

[0005] It can continue at a long period of time, and the inside of a box with respiration, etc. can be dehumidified, and the place which it is made in order that this invention may solve this conventional problem, and is made into the purpose is simple for structure, and there is handling in providing an easy dehumidifier system.

[0006]

[Means for solving problem] As a means for attaining said purpose, [a dehumidifier system given in this invention

Claim 1] It had an aeration object which provides a gap in the inside of said tube-like object, arranges the tube-like object which forms the aeration way which is attached to the wall of a container and opens inner and the exterior of this container for free passage, and two or more waterproof membranes which have a penetration micropore in which; moisture permeation is possible, and covers said aeration way to two or more steps, and composition provided with; [0007]In the dehumidifier system according to claim 2, it had composition provided with the oscillating means which gives aerial vibration pressure to said waterproof membrane in the dehumidifier system according to claim 1.

[0008]In the dehumidifier system according to claim 3, in the dehumidifier system according to claim 1 or 2, said aeration way turned the cooling unit to the container side bordering on the waterproof membrane, and it was considered as composition provided with the electronic cooling element which turned the exothermic part to the open air side.

[0009]

[Function]An aeration way is established in a container, it concentrates on this aeration way and respiration is made to perform in the dehumidifier system according to claim 1. Since said aeration way is in the state where it was covered by two or more steps by providing a gap and arranging a waterproof membrane, it can prevent waterdrop from invading in a container from this aeration way. Since said waterproof membrane has a penetration micropore in which moisture permeation is possible, it can concentrate through this aeration way and the container can perform respiration. In this case, in the time of an inhalation operation, the open air is inhaled until the internal pressure of a container balances the exterior. Then, when the concentration of steam in the open air is higher than the steam concentration in a container, it moves until steam balances to the container side via a penetration micropore, but since the concentration of container inland sea steam increases in ****, it becomes slow [the migration by the side of the container of steam]. When the concentration of steam in a container is higher than the concentration of the open air, steam in a container moves to the open air side. In this case, since the steam concentration of the open air discharged steam in a container and it does not become high, it does not become slow steam's moving it. Therefore, this dehumidifier system can be leaned to the water vapor migration in container discharge-side, and can perform a dehumidification operation.

[0010]In the dehumidifier system according to claim 2, since aerial vibration pressure is made to give the field of a waterproof membrane, the steam which diffusion of steam is

promoted and invades into the penetration micropore of a waterproof membrane from the inside of a container can be positively moved to the open air side, and a dehumidification operation can be promoted.

[0011] Into Komuro formed in the dehumidifier system according to claim 3 by covering an aeration way to two or more steps by a waterproof membrane, make low temperature by the side of the container of this areole, and. Since temperature by the side of the open air can be made high, diffusion of steam is promoted and steam in a container is positively moved to the open air side, a dehumidification operation can be promoted.

[0012]

[Working example] The 1st work example explains a dehumidifier system given in this invention Claim 1 in detail below. Drawing 1 is a sectional view showing the dehumidifier system of this example. The dehumidifier system A of this example is considering the tubed casing 1 and the aeration object 2 as main composition.

[0013] The attaching hole 10a established in the box 10 which should be dehumidified is made to equip with said tubed casing 1, and it is formed so that it may have the flange 12 and this flange 12 side may be fixed to the end side of the tube-like object which forms the aeration way 11 with a bundle with the screw 13 at the open air side 10b of the box 10. This end side opening was made into the exit 14 of steam, and the protection network 15 which prevents invasion of an insect or a foreign substance all over the is stretched. Arrange the other end side opening of this tubed casing 1 to the interior-of-a-room side 10c of the box 10, and it is considered as the entrance 16 of steam, and is formed so that screwing of the stop ring 17 which forms a female screw in the end and has a male screw in a peripheral face is possible. 18 in a figure is rubber packing with which it is made to equip between the box 10 and the flange 12.

[0014] Said aeration object 2 prevents invasion of waterdrop, and makes respiration perform in the box 10, and it makes a dehumidification operation in the box 10 perform, and is formed of a waterproof membrane of four sheets in which moisture permeation is possible. The 1st film 20a whose average pore size of the box 10 side to a penetration micropore of said waterproof membrane is 0.1 micrometer, It is equipped with four sheets which are the 2nd film 20b whose average pore size is 0.2 micrometer, the 3rd film 20c whose average pore size is 0.5 micrometer, and the 4th film 20d whose average pore size is 0.6 micrometer in said tubed casing 1 at the same gap via the spacer 21 of watertight construction, enabling free attachment and detachment. In this state, the three areoles 11a, 11b, and 11c are formed towards the exit 14 in the aeration way 11 of the tubed

casing 1 from the entrance 16.

[0015]Said each waterproof membrane pierces to disc-like what was backed and reinforced with a network (not shown), respectively, Water vapor permeability becomes large towards the entrance 16 of the tubed casing 1 to the exit 14 by arranging as mentioned above (1st film and 2nd film 6800 g/m² and day, 3rd film 7200 g/m² and day, 4th film 7500 g/m² and day). A 4 ****-ized ethylene resin porous membrane of the Nitto Denko Corporation manufacture was used for said each waterproof membrane as registered trademark micro textile.

[0016]Next, an operation is explained. The dehumidifier system A equips the aeration way 11 with the aeration object 2, is formed, and is inserted and attached to the attaching hole 10a of the box 10 via the rubber packing 18. In this state, the waterproof membrane of four sheets and three areoles will intervene between the interior-of-a-room side of the box 10, and the open air side [10b] 10c. First, the box 10 can perform respiration, without making waterdrop invade with the 4th film 20d. And in the time of an inhalation operation of the box 10, it inhales until the internal pressure of the box 10 balances the open air, and after this, when the concentration of steam in the open air is higher than the steam concentration in a box, steam moves to the interior-of-a-room side 10c side via each waterproof membrane. Migration of steam becomes very slow as the concentration of steam by the side of [10c] the interior of a room increases at this time, since the box side is small in the average pore size and water vapor permeability of the waterproof membrane.

[0017]Next, when the steam concentration by the side of [10c] the interior of a room in the box 10 is higher than the steam concentration of the open air, steam by the side of the interior of a room moves to the open air side 10b. In this case. [each areoles 11a, 11b, and 11c in an aeration way] The waterproof membrane of the direction respectively near the open air side 10b has water vapor permeability larger than the waterproof membrane by the side of [10c] the interior of a room, and moreover, since it does not become high even if the steam concentration by the side of the open air discharges steam by the side of the interior of a room, and the concentration gradient of steam is low maintained for the areole near the open air side, migration of steam is promoted. Therefore, the dehumidifier system A can perform a dehumidification operation of the box 10.

[0018]As mentioned above, as explained, in the dehumidifier system A of this example, it can continue at a long period of time, and the inside of a box with respiration can be dehumidified. Structure is easy and attachment and handling are very easy.

[0019]Next, the 2nd work example is described based on drawing 2. In this example, said 1st work example and an identical configuration portion attach the same numerals, and the explanation is omitted. The 1st film 30a, the 2nd film 30b, the 3rd film 30c, and the 4th film 30d which constitute the aeration object 3 use the dehumidifier system B of this example as the waterproof membrane (0.6 micrometer in the aperture of a penetration micropore, water-vapor-permeability 7500 g/m² and day) of the same physical properties, and. Expanding the capacity of the areoles 31a, 31b, and 31c one by one, and making the concentration gradient of steam at the time of dehumidification form has the feature by turning a waterproof membrane gap to the open air side 10b, and enlarging it one by one from the interior-of-a-room side 10c. The tubed casing 4 of this example is formed so that the ring 40 which has a male screw and has a female screw may be screwed on and it may fix to the interior-of-a-room side 10c side with a bundle between the flanges 41, 42 in a figure is ORINGU for waterproofing. When the steam concentration by the side of [10c] the interior of a room is higher than the open air side 10b, since steam moves without being controlled from the areole side with small capacity by areole with larger capacity, the dehumidifier system B of this example has the same effect as the dehumidifier system A of the 1st work example as well as the 1st work example.

[0020]Next, the 3rd work example explains the dehumidifier system according to claim 2. Also in this example, said work example and an identical configuration portion attach the same numerals, and the explanation is omitted. Drawing 3 is a sectional view showing a dehumidifier system of this example. It has the feature that the dehumidifier system C of this example formed the oscillating means 5 in the interior-of-a-room side. Namely, the ring shape frame 50 is screwed on the entrance 60 of the tubed casing 6, and, as for said oscillating means 5, the circle shape magnet 51 is being fixed to this frame 50. The inside 50a of a figure is a vent. And it is being fixed to the diaphragm 52, where it was provided in the state where the diaphragm 52 ****(ed) by the flexible support member 53 at the end of said frame 50 at the 1st film 20a and the moving coil 54 is inserted in said circle shape magnet 51. This moving coil 54 is connected to amplifier (not shown) which outputs aerial vibration pressure (the number grade of low frequency). Since the dehumidifier system C of this example moves positively steam which diffusion of steam is promoted and invades into a penetration micropore by always giving aerial vibration pressure to a waterproof membrane from the interior-of-a-room side 10c to the open air side 10b, it can promote a dehumidification operation. In this example, a

moisture sensor is formed in the interior-of-a-room and open air side [10b] 10c, and when indoor steam concentration becomes higher than the open air side, it may form so that an oscillating means may be operated.

[0021]Next, the 4th work example explains the dehumidifier system according to claim 3. Also in this example, said work example and an identical configuration portion attach identical codes, and the explanation is omitted. Drawing 4 is a sectional view showing the important section of the dehumidifier system D of this example formed the electronic cooling element 6 in the aeration object 2.

[0022]Said electronic cooling element 6 turns the cooling unit 60 to the interior-of-a-room side 10c of the 1st film 20a, the 2nd film 20b, the 3rd film 20c, and the 4th film 20d, and it turns and arranges the exothermic part 61, cuts membranous [some], respectively, and is attached to the open air side 10b via the packing of watertightness. [by making a very weak cooling action and an exothermic operation perform to each electronic cooling element 6, and controlling so that the temperature of the areole 11a by the side of the box 10 becomes low and the temperature of the open air side areole 11c becomes high] The concentration gradient of steam in the aeration way 11 is leaned to the open air side, and diffusion of steam is promoted, positive migration of the steam can be carried out at the open air side, and a dehumidification operation can be promoted. Also in this example, a temperature sensor is provided in the interior-of-a-room and outdoor side [10b] 10c, and when indoor steam concentration becomes higher than the open air, it may form so that an electronic cooling element may be made to act.

[0023]As mentioned above, although the work example of this invention has been described, even if the concrete composition of this invention has a design variation etc. of the range which is not limited to said work example and does not deviate from the gist of an invention, it is included in this invention. For example, number of sheets, lining material, etc. of a waterproof membrane can be set up arbitrarily.

[0024]The combination of a waterproof membrane is arbitrary.

[0025]Attachment can be performed not only to electric products but to a gear case, a container, etc. It can also attach to a gear case via a trap.

[0026]The adjustment device of the water vapor pressure which used the capillary tube for promotion of dehumidification may be added.

[0027]The oscillating means can set up arbitrarily not only a moving coil type but a crystal type, a piezoelectric element

type, etc. Attachment, such as both sides of not only the interior-of-a-room side but an outdoor side and outside the interior of a room, is possible also for attachment, and aerial vibration pressure and vibration frequency can also combine strength, height, etc. variously.

[0028] Two or more dehumidifier systems may be formed in a box. Other dehumidifier systems make air introduce at the time of dehumidification, and it may be made for at least one of dehumidifier systems of it to heighten the whole dehumidification capability by giving water vapor permeability lower than other dehumidifier systems and the high degree of aeration.

[0029] It may be made to heighten dehumidification capability by providing a fan between the interior-of-a-room side of a dehumidifier system, an outdoor side, or waterproof membranes, making a waterproof membrane side compress the air by the side of the interior of a room with this fan, and raising steam concentration locally.

[0030]

[Effect of the Invention] As mentioned above, if it is in a dehumidifier system given in this invention Claim 1 as explained, it writes with said composition, and it can continue at a long period of time, and the inside of a container with respiration can be dehumidified. The effect that structure is easy and attachment and handling are very easy is acquired. If it is in the dehumidifier system according to claim 2, the effect that a dehumidification operation can be promoted is acquired by giving aerial vibration pressure to a waterproof membrane outside the effect in said Claim 1. If it is in the dehumidifier system according to claim 3, the concentration gradient of steam in the inside of an aeration way is leaned to the open air side outside the effect in said Claim 1, and the effect that a dehumidification operation can be promoted is acquired.

[Brief Description of the Drawings]

[Drawing 1] It is a sectional view showing the dehumidifier system of the 1st work example of this invention.

[Drawing 2] It is a sectional view showing the dehumidifier system of the 2nd work example.

[Drawing 3] It is a sectional view showing the dehumidifier system of the 3rd work example.

[Drawing 4] It is a sectional view showing the important section of the dehumidifier system of the 4th work example.

[Explanations of letters or numerals]

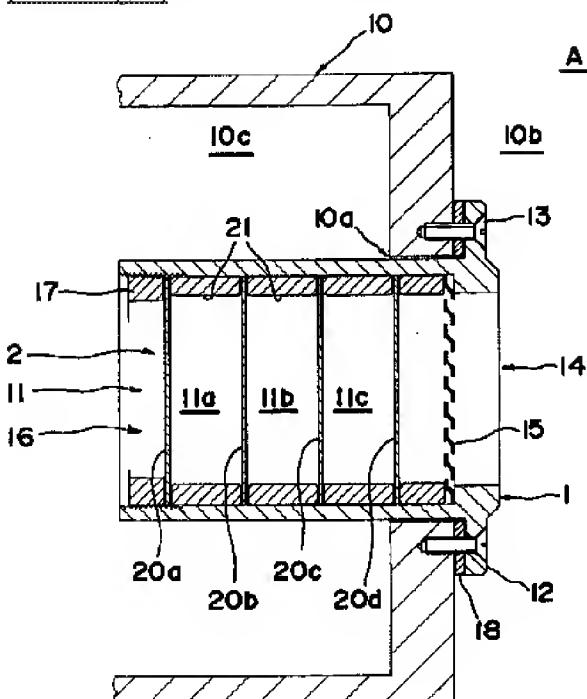
A, B, C, and D Dehumidifier system

1 and 4 Tubed casing

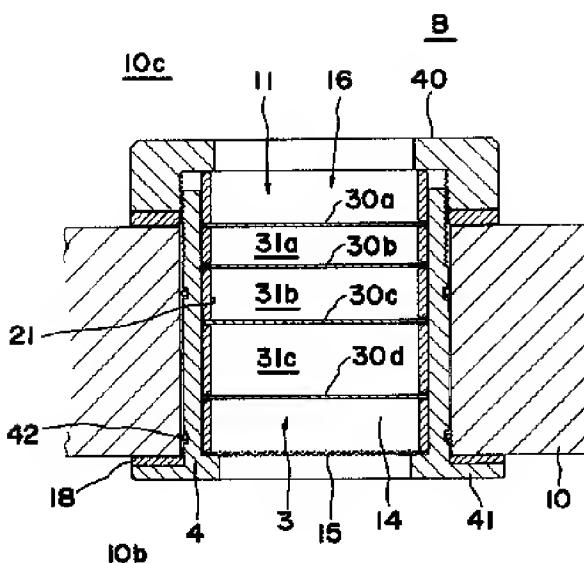
2 and 3 Aeration object

- 5 Oscillating means
- 6 Electronic cooling element
- 10 Box (container)
- 10b Open air side
- 10c Interior-of-a-room side (inside of a container)
- 11 Aeration way
- 11a, 11b, and 11c Areole
- 20a and 30a The 1st film
- 20b and 30b The 2nd film
- 20c and 30c The 3rd film
- 20d and 30d The 4th film
- 51 Circle shape magnet (oscillating means)
- 52 Diaphragm (oscillating means)
- 54 Moving coil (oscillating means)

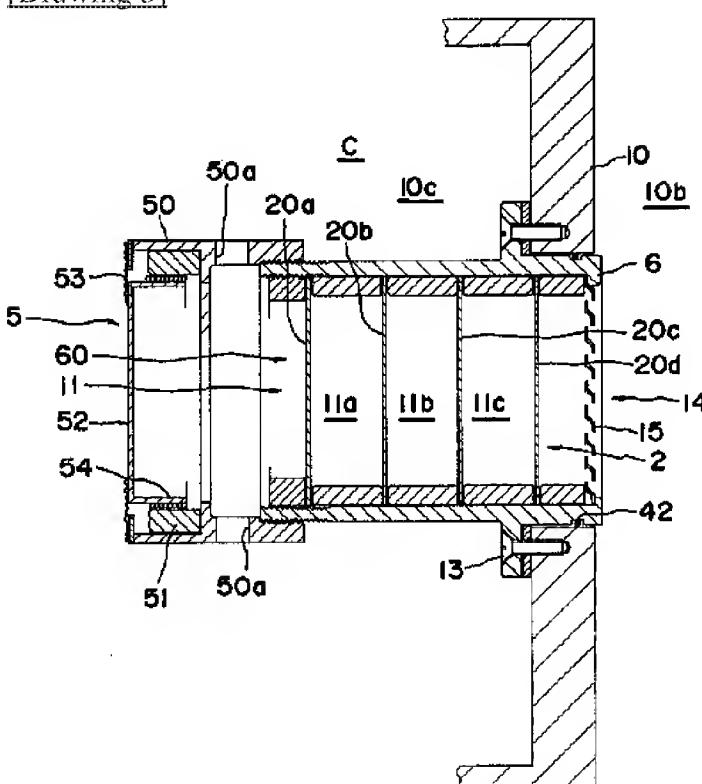
[Drawing 1]



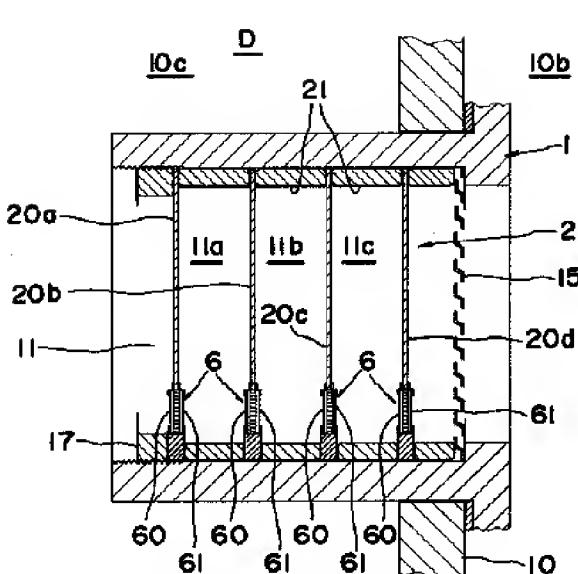
[Drawing 2]



[Drawing 3]



[Drawing 4]



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